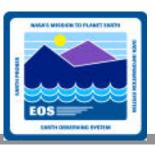


Acceptance Test Status Andy Miller

2 September 1997

FOS RRR Roadmap



Overview Material

FOS Overview

- RRR Objectives
- FOS Status & Schedule

FOS CSR Action Items

- CSR Action Item Status

Functional Overview -List of FOS capabilities

FOS Acceptance Test Status

Acceptance Test Status

- Test Results
- Technical Liens & Issues
- External Interface Test Status

FOS Audits

Audit Results

- Physical Cfg Audit (PCA)
- Functional Cfg Audit (FCA)

FOS Next Steps

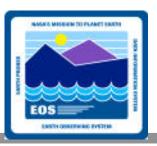
Post-Acceptance Test Plan

- External Engineering Tests
- IST Delivery
- FOT Plans

Post-B Development/ Sustaining Engineering/

- Approach
- Schedule





Started after Test Readiness Review (late May)

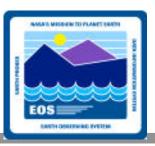
ECT-2 Dry-Run/ECT-2 (late June)

Dry-Runs (June through August)

- Ensure test procedures and software is ready for Acceptance Test
 - Software
 - Test Procedures
 - System Configuration

Acceptance Test (late July through August)

Acceptance Test Objectives



Execute Release B Test Cases

- Verify test cases
- Verify Level 4, RBR & IRD Requirements
- Verify NCRs

Document Results of Acceptance Test Conduct

- Test Logs
- Requirements Check-off matrix
- NCRs database of opened, closed, and verified NCRs

EOC Test Process

Daily Test Status & Schedules

FOS Acceptance Testing



Conduct Tests

Witness Tests

NASA FOS

Quality Assurance

Test Team
- FOS
- ATO



Monitor Tests

EGS IV&V

Flight Operations Team

Execute Test Cases

- Maintain Test Logs
- Prepare FCA Material

Verification

- Verify RBRs + L4 Requirements
- NCR Verification

FOS Test Status Reporting Overview



Test Status States

Pass



- All functions are operable
- All test success criteria, as defined for the test procedure, have been successfully met

Partial



- Major functionality is operable
- Not all success criteria has been met

Fail



- Some functions are inoperable
- Testing the major functions for the test has been impeded

<Test Title>

Functionality

☐ Description of key functionality that has been verified

<Test Title>

Functionality

☐ Description of key functionality that has been verified

 Description of key functionality that has not been verified

Issues

List key issue(s) that remain re: this test

<Test Title>

Functionality

• Description of key functionality associated with this test case



EOS

FOS Test Case Summary

Test Case Change Summary

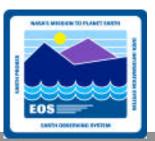
Added Year 2000/Leap Year Test

Test Results

- 102 test case in baseline
- 84 test cases executed
 - 46 test cases passed
 - 38 test cases partial
- 18 test cases not performed

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Test Groups



Infrastructure

- Database(DBS)
- User Interface(FUI)
- Events (EVT)

Command

- Planning and Scheduling (PAS)
- Command Management (CMS)
- Command (CMD)

Telemetry

- Telemetry (TLM)
- Analysis (ANA)

External Interfaces

- SAS
- ASTER (ASTR)
- EDOS
- FDF
- NCC

End-to-End

- Contacts (CONT)
- IST
- System (SYS)
- End-to-End (ETE)

Operations

- Hardware (HRD)
- Operational (OPR)

Infrastructure Tests (24)



User Interface (16)

- Screen Management
- User Customization
- Data Mover
- Display Builder (Alphanumerics)
- ECL Directives
- Procedure Builder
- Procedure Control & Execution
- Room Builder
- OASIS/CSTOL Conversion
- User Authentication & Display
- Display Builder (Graphs & Tables)
- Display Builder (Schematics)
- Document Reader
- E-mail
- Quick Message Generator
- On-Line Help

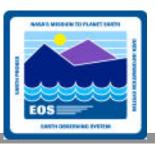
Data Base (4)

- Database Ingest, Validation & ODF Generation
- Database Backup & Restore
- Database Reporting
- Database Editing

Events (4)

- Event Message Display & Graphical Timeline
- Event Messge Filtering
- Event History Request & Reporting
- Alarm Message Handling

User Interface Status (1 of 2)



Screen Mgt

Functionality

- ECL directive proc
- Window/room mgt
- 田 3-line event

Issues

Room mgt

Retrieve 20 recent directives

Proc Builder

Functionality ■ Verify ECL directives

ECL Directives

for syntax

■ Execute from Unix shell command

■ Verify privileges and exec within 0.5 sec's

<u>Issues</u>

ECL syntax (minor)

User Custom

Functionality

- ⊞ Color schema
- Default directories
- Default printers

Issues

No confirmation for default definitions

Data Mover

Functionality

☐ Transfer files from local to system directories and viceversa

□ Delete files from local storage areas

Display (Alpha)

Functionality

⊞ Create, save, modify, and delete display pages

■ Add, modify, and delete items on display pages

□ Display ground and telemetry parameters

Proc Builde

Functionality

☐ Create, update, and save procedures

■ Verify proc constructs& ECL syntax

<u>Issues</u>

Entering binary and hex values ECL syntax (minor)

Proc Control

Functionality

Execution & control within the proc control window

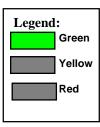
<u>Issues</u>

Intermittent problems executing procs from cmd control window (aligning commands with execution status)

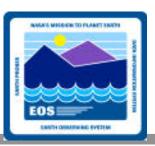
OASIS/CSTOL

Functionality

⊞ Convert AM-1 CSTOL procedures to ECL syntax



User Interface Status (2 of 2)



User Authen

Functionality

⊞ Ensure valid user login

■ Selection of user roles

Add, modify, and delete users from the system

Issues

Invalid user roles can be performed

Doc Reader

Functionality ■ Browse on-line doc ■ Search on-line doc ■ Manipulate hypertext documentation

Room Builder

Functionality

 □ Define, modify, save, & delete a room

Add, delete, and resize windows in a room

Allow a room to consist of 0 to 12 windows

Issues

Can't permanently save a room (current session only)

E-mail

Functionality

delete e-mail messages

■ Send e-mail messages

Issues

Can't perform search on e-mail messages

Display Graph

Functionality

☐ Create, save, modify, & customize graphs

 □ Display at least 6 mnemonics in graph

tlm values in a table

Issues

Customization of graphs

Quick Msg

Functionality

and Fatal

■ Send messages to

■ Severity levels include

Info, Warning, Alarm,

the event display

OnLine Help

descriptions of help for the users via

Display Schem

⊞ Build, save, and

modify a schematic

points, lines, icons, text,

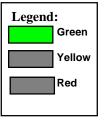
ellipses, and polygons

schematics that have

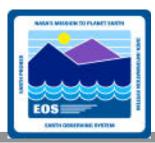
circles, rectangles,

Functionality

Functionality Netscape



Data Base Status



DB Ingest, Val, & ODF Gen

Functionality

☐ Ingest tlm and cmd definitions

☐ Generate operational data files error free

DB Backup & Restore

Functionality

- Backup Unvalidated, Validated, and Ops databases
- Restore databases

<u>Issues</u>

DB Reporting

Functionality

Generate, view, and print entire or partial PDB, load catalog, and FDF reports using the Web pages

<u>Issue</u>

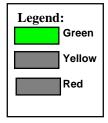
Cannot get selective report by tlm mnemonic

DB Editing

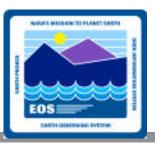
Functionality

☐ Edit PDB definition files using the Database
Web pages

■ Modify, add, or delete a command, telemetry, or an event definition



Events Status



Evt Msg Display & Graph Timeline

Functionality

- Generate and display events
- Filter events by multiple ways using selection filter
- Display scrolling events based on time range selected

Evt Msg Filtering

Functionality

- Display global and local events
- Manipulate events via filtering options

Evt His Request & Reporting

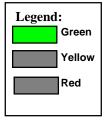
Functionality

- Retrieve all requested events
- Specify start/stop times event types, events id, s/c and instrument id
- Retrieve filtered events
- Store event history request for future use

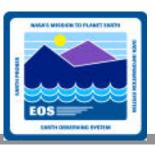
Alarm Msg Handling

Functionality

■ Acknowledge messages that have a severity level of 'alarm' by pressing the 'ACK' button



Command Tests (27)



Planning & Scheduling (11)

- Activity Definer Tool
- BAP Definer Tool
- General Scheduler
- EOC Timeline- Display & Manip
- EOC Timeline Management
- Contact Scheduler
- Activity Constraint Definitions
- Scheduling Load Uplink Activities
- Receive & Sched Late Change Requests
- What-If Planning & Scheduling
- DAS Generation

Command Management (8)

- Memory Dump Image
- Table Load Validation & Gen
- Microprocessor & Flight Software Load Gen & Validation
- ATC Load Gen & Validation
- ATC Load Management
- Validate & Generate RTS Load
- RTS Load Management
- Table Load Management

Command (8)

- Command Authorization
- Command Generation
- Ground Script Control
- Ground Script Commanding
- Manual Commanding
- Uplink Loads
- Command Modes, Transmission, and Uplink
- Telemetry and Command Receipt Verification

Planning & Scheduling Status (1 of 2)



Activity Definer

Include cmd sequence with relative times & params, modes

■ Save, open, close, and delete for auth users <u>Issues</u>
Define activity w/procs

BAP Definer Tool

Functionality

☐ Create BAP for s/c or instrument

■ Defined sequence contains off-set times

■ Save, open, close, & delete for aut users

Issues
Define activity w/procs

General Sched

Functionality

■ Sched activities, BAPs, commands and procs against master mission plan

■ Sched in impact, nonimpact, and oversubscribe modes

■ Delete or unschedule activities

EOC Timeline - Display & Manip

<u>Functionality</u>

■ Display activities & events with associated detailed info

■ Manipulate config, viewing area, and display colors

EOC Timoline - Mat

Functionality

Manage multiple plans concurrently, setting up user permissions in accordance with resources & ownership

<u>Issues</u> Users role anomalies

Contact Scheduler

Functionality

☐ Create contact activities

& sched on mission plan

III TDRSS & Ground Contact activities

■ Batch scheduling to verify multiple sched lssues Several workarounds were required

ActivityConstraint Definitions

■ Develop 'hard' & 'soft' constraints with order and time spacing conditions

☐ Timeline will show graphical rep of timeline violations

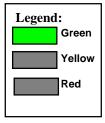
Sch Load Uplink Activities

Functionality

☐ Gen DAS & ATC loads

■ ATC loads are sched and verified against requested and valid uplink periods

Issues
User-specified uplink
window intermittently
overridden



Planning & Scheduling Status (2 of 2)



Receive & Sch Late Changes

Functionality

■ Schedule activities on the timeline

In Identify any constraint violations

☐ Create a DAS and regenerate a DAS with requested changes

What-If Planning & Sched

Functionality

☐ Create what-if plans on the timeline

■ View, save, and delete options

■ What-if capability and its impact on the Master Plan

DAS Generation

Functionality

☐ Create activities to build ATC load, validate command constraints, populate a DAS period
☐

■ Notification of constraint violations

⊞ Hard constraints prohibit DAS generation

Issues
Procs in DAS
Gen DAS with
uplink loads



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Command Management Status



Memory Dump Image

Functionality

■ Dump & store S/C memory

■ Enable user to overwrite ground reference image with the dump contents

<u>Issues</u>

Reverse eng'g of dump RTS & Table ground ref

Table Load Valid & Generation

<u>Functionality</u>

■ User generation of Table Load file

☐ Pre-defined templates are provided to define tables per database

☐

■ Storage of uplink load data, load image, load report, and load catalog entry

Microprocessor & FSW Load Gen

Functionality

☐ Generate instrument loads from microprocessor load contents

■ Update load catalog with an entry for the uplink load

ATC Load Gen & Validation

Functionality

⊞ Generate ATC load from DAS

■ Generate ground script

ATC Load Mgt

Functionality

□ Create partitioned ATC load

■ Manipulate the ATC buffer display

Validate & Gen RTS Loads

Functionality

☐ Generate RTS load, image load file, load report

□ Check for hard and soft constraints

<u>Issues</u>

Have not verified all constraints (ATC-only)

RTS Load Mgt

<u>Functionality</u>

Modeling of RTS buffer for the 128 locations on the ground

■ View all available RTS loads

■ Store RTS loads in the load catalog

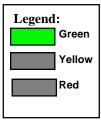
Table Load Mgt

Functionality

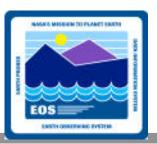
m Modeling of table loads

■ View all available table loads

■ Store table loads in the load catalog



Command Status



Cmd Authorization

<u>Functionality</u>

■ Support user request for command authority

■ Deny command prive
 to unauthorized users

Cmd Generation

Functionality

■ Encase packets in CLTU

■ Monitor S/C CLCWs for command receipt verif

☐ Generate FARM control commands

Ground Script Control

Functionality

■ Ground script control characteristics including suspend, resume, jump, and stop

■ Display status of executing ground script

Issues
Intermittent ground
script errors

Ground Script Commanding

Functionality

■ Manage override of critical commands and prerequisite state failures

Manual Commanding

Functionality

■ Validate submnem's, hazardous, critical, and prerequisite state check commands

Uplink Loads

Functionality

☐ Uplink RTS, Table, instrument, & flight s/w loads

 Verify successful dispatch of loads via telemetry

Issues

Load verif not possible w/current AM1 DB

Cmd Modes, Transmission

Functionality

■ Select command rates

■ Select active CTIU

田 Transmit cmd's to S/C

⊞ Enable retransmissions

Issues

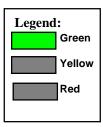
Intermittent issue with selecting CTIU

Tlm Ver & Cmd Uplink Verif

Functionality

Verify command receipt

☐ Provide telemetry verification status



Telemetry Tests (26)



Telemetry(15)

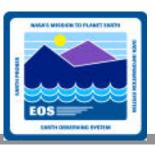
- Decom H&S/Standby TIm
- Decom Housekeeping
- Decom Context Dependent TIm
- EU Conversion
- User Adjustment of EU Conversions
- MultiByte Parameter Processing
- Derived Parameters
- Data Quality Determination
- Red/Yellow Limits
- Delta Limits
- Info Window
- Real-time Data Dropout
- Real-Time Telemetry Archive
- Multiple Source Tlm Data Receipt and Display
- Telemetry Replay Processing & Display

Analysis (11)

- Dataset Generation
- Standing Order Manager
- S/C Clock Correlation (RDD)
- S/C Clock Correlation (USCCS)
- Special Processing Algorithms
- Time Order Downlink Report
- Parameter Out of Limits Report
- Analysis Products Cross DB
- System Generated Stats
- User Specified Stats
- Analysis Request Mgt

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Telemetry Status (1 of 2)



Decom - H&S, Standby Tlm

Functionality

■ Decommutate and display health and safety and standby telemtry

Decom - H/K Tlm

Functionality

■ Decommutate and display housekeeping telemetry

Decom - Context Dependent TIm

Functionality

 Decommutation of context dependent telemetry

EU Conversion

Functionality

■ Conversion of raw telemetry to engineering units using 7th order polynomial equations, line segments, and exponential

User Adjustment of EU Conversions

Functionality

■ User modification of polynomial coefficients Selection of specific EU equation to use for limit checking

Multi-Byte Parameter Proc

Functionality

■ Processing of telemetry parameters that are non-contiguous in a packet

Derived Parameters

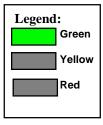
Functionality

 Processing of derived parameters based on a database defined equation consisting of telemetry parameters and/or constants and simple math functions

Data Quality Determination

Functionality

■ Determination of packet data quality



Telemetry Status (2 of 2)



Red/Yellow Limits

Functionality

☐ Determine if tlm values are within red & yellow limit set range

☐ Check of multiple limits sets

■ Display of limit set check status

<u>Issues</u>

User adjustment of limits

Delta Limits

Functionality

■ Check of telemetry parameters to determine if they are within the db-defined delta range

Info Window

Functionality

• Tool to provide db information re: tlm parameters including limit set values, delta values, EU equations

Real-Time Data Dropout

Functionality

■ Detection of tlm data dropout (e.g., at LOS)

Real-Time Tlm Archive

Functionality

■ Archive of real-time tlm for housekeeping, health & safety, and standby on both the I and Q channels

Multiple Source Tlm Receipt

Functionality

■ Concurrent flow of telemetry from both the I and Q channels

TIm Replay Proc & Display

Functionality

■ Dedicated replay of archive telemetry for housekeeping, health & safety, and standby telemetry



Analysis Status (1 of 2)



Dataset Generation

<u>Functionality</u>

☐ Generation of datasets based on archived tlm

☐ Display & print datasets

⊞ Gen of carryout files

<u>Issues</u>

Workaround to print file Carryout format has minor error

Standing Order Manager

Functionality

 Create routine analysis requests to execute at user-specified periodic times

Clock Correlation - RDD

Functionality

 Perform S/C clock correlation using the Return Data Delay method

Clock Correlation - USCCS

Functionality

 Perform S/C clock correlation using the USCCS method

Special Proc Algorithms

Functionality

- Allow users to create their own algorithms which can be applied against archived tlm
- Allow users to use FFT, data smoothing, etc. functions

Custom Reports

Functionality

 Allow user to produce customized reports using a combination of graphs, tables, and report data

Parameter Out Of Limit Report

Functionality

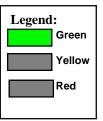
 Reports for telemetry parameters that are out of limit range

Analysis Products DB Crossover

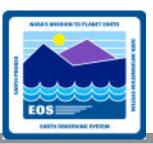
Functionality

■ Generation of dataset products based on telemetry archive data that crosses over the time frame when different databases are active

Issues
Display workaround required



Analysis Status (2 of 2)



System Gen Statistics

Functionality

- Generation of system statistics
- System statistics are automatically accumulated based on receipt of back-orbit telemetry

User Specified Statistics

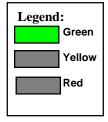
Functionality ⊞ Generation of stats report based on user requested data time and telemetry parameters

Issues
Workaround to display
stats data

Analysis Request Management

Functionality

 Enable distributed processing of analysis requests using multiple analysis workstations



External Tests (11)



ASTER (1)

ASTER Scheduling & IST Access

FDF (1)

FDF Interface

NCC(3)

- NCC GCMR Processing
- UPD Receipt & Archive
- Ground Telemetry Replay

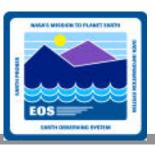
EDOS(5)

- CODA Processing & Archive
- Ground Telemetry Analysis
- Test Command/Command Echo Exchange
- SCS Summary Report
- Receive & Forward Trash Buffer

SAS (1)

• Remote Access & Carry-Out File Transfer

External Test Status (1 of 2)



ASTER Sched & IST Access

Functionality

☐ Perform ASTER sched

■ Receipt, constraint check ASTER STS, ODS

Integration of ASTER data into Master Plan

Issues
Preliminary Resource
Sch to ASTER has a
few ICD discrepancies

Ground Tim Replay

Functionality

 Replay of NCC UPD data and EDOS CODA data, which was archived

 Display of replayed UPD and CODA data on user-defined pages

FDF Interface

Functionality

☐ Ingest of FDF products, validation, and population into the db

☐ Process FDF products including table load gen, orbital event gen

☐

Issues
Analysis products
Validation report

CODA Processing & Archive

Functionality

☐ Receive, archive, and display CODA data sent from EDOS

NCC GCMR Processing

Functionality
国 Send GCMRs to NCC

UPD Receipt & Archive

<u>Functionality</u>

■ Send User Performance

⊞ Send User Performance
 Data (UPD) messages
 to the NCC

■ Receive, archive and display UPD status data from NCC

Ground Telemetry Analysis

Functionality

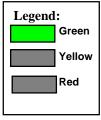
- Creation of analysis statistics based on
- UPD data and CODA data received by FOS
- Generation of analysis reports based on user requests on the ground telemetry data

Test Cmd/Cmd Echo Exchange

<u>Functionality</u>

- Transmission of cmd test blocks to EDOS
- Receive related cmd echo blocks (CEB) from EDOS

■ User specify timeout value for CEB receipt



External Test Status (2 of 2)



SCS Summary Report

Functionality

- Receipt & processing of the SCS Summary Report received from EDOS
- Display capability for the users of the processed report

Receive & Forward Trash Buffer

Functionality ☐ Receipt of SSR trash buffer from EDOS

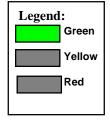
☐ Transfer trash buffer to the SAS

<u>Issues</u> User notification

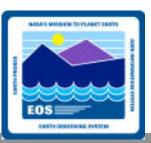
Remote Access & CarryOut File Transfer

Functionality

☐ Transfer of carry-out product to the SAS



End-to-End Tests (12)



Contacts (4)

- DSS
- S/C Activity Log
- SSR Monitoring
- S/C State Check

IST (2)

- IST Pool Management
- IST Functionality

End-to-End (3)

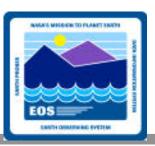
- Concurrent Ops/Perf Monitor
- ECT-2 Scenario
- Year 2000/Leap Year

System(3)

- FOS Startup/Shutdown
- Logical String Config Control& Termination
- Failure Recovery & Status Monitoring

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End-to-End Test Status (1 of 2)



Decision Support

Functionality

■ Monitor telemetry
quality via correlation
of CODA, UPD, and
housekeeping tlm

■ Detect and recognize ACE/SAD misconfig while in safe-hold and cmd decoder anomalies

S/C Activity Log

Functionality

Receipt of S/C activity log entries embedded in housekeeping tlm

■ Dump of S/C activity log table and log into contiguous archive

History report of s/c activity data

SSR Monitoring

Functionality

- SSR buffer data predicts
- Correlate SSR dumps using UPD, CODA, and telemetry
- Recommend actions to operators re: SSR mgt

S/C State Check

Functionality

■ Creation of command list for expected values of commands executed in back-orbit (s/c state check tlm values)

■ Compare and report actual s/c state check tlm values vs. expected

IST Pool Mgt

Functionality

- Manage max # of IST connections
- Manage max # of concurrent users for a specific instrument

IST Functionality

Functionality

- Real-time monitoring
- of tlm and command 囲 Event reporting
- 田 User interface tools

<u>Issues</u>

By-product of other EOC

Some file cfg items; HP

Concurrent/Ops Perf Monitor

Functionality

⊞ Concurrent ops (sched, real-time, and off-line activities

 ⊞ Computer performance analysis for all nodes Real-time tlm and cmd rates

<u>Issues</u> Telemetry performance

ECT-2 Scenario

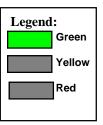
Functionality

⊞ Schedule activities

⊞ Build table, RTS, and ATC loads

■ Uplink loads & procs S/C dumps and compares

■ Real-time tlm & cmd monitoring



End-to-End Test Status (2 of 2)



Year 2000 Time Test

Functionality

☐ Ensure all FOS
functionality handles
Year 2000 transition

• Ensure all FOS functionality handles leap year conversions

<u>Issues</u> Leap year unverified

FOS Startup/ Shutdown

Functionality

■ Startup and shutdown procedures for FOS servers and workstations

Logical String Cfg Control & Termination

Functionality

Establish logical strings for ops, test, and training modes

<u>Issues</u>

Iterative enabling/disabling of tailored logical strings

Failure Recover & Status Monitoring

Functionality

Automated failover of logical strings for real-time server

■ Ensure ground script operation is maintained during failure recovery

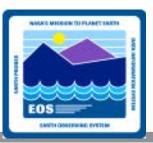
■ Status monitoring of system resources

Issues

Did not verify failover of LANs and file server



Operations Status



Operations (2)

- Hardware
- Functional Requirement Analysis

Hardware

Functionality

Hardware components including servers and workstations, file servers, and peripherals

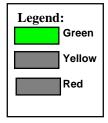
Issues
Requirements need
some minor refinement

Functional Reqt Analysis

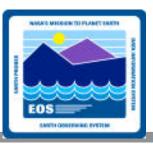
Functionality

☐ Requirements that are operational or verified via design analysis

Issues
Requirements need
some minor refinement



IST Status



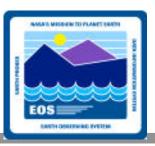
Verified Functionality

- Planning & Scheduling
- Real-Time monitoring
- Events
- Display Builder

Unverified Functionality

- Command Management
- Command Request
- Procedure Builder
- Pool Management

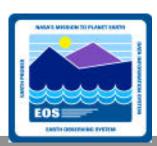
Performance Results



ETE-2000B Test Case - Concurrent Ops/Performance Monitor

- Objective
 - Benchmark performance data based on realistic, concurrent operational scenarios
 - Identify current performance status and identify areas within system that need attention
 - Identify status of FOS performance vs. performance requirements
- Real-Time Contact Sessions (3)
 - NCC UPD and EDOS CODA processing
 - Telemetry monitoring and commanding
- Off-line Scenario
 - Display page and procedure generation
 - Scheduling and load generation
 - Analysis Requests
 - Telemetry Replay

Performance Results Overview



Commanding

4 EOC delay of approximately 500 milliseconds associated with building and sending simple commands.

Delay for the first FS1 command with submnemonics was over 7.5 seconds, far short of the 500 millisecond requirement. Subsequent commands were not subject to this delay.

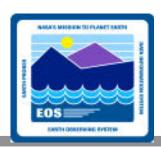
Telemetry Decommutation

4 Few missed Packets at 16 and 25 Kbps Housekeeping on the I and Q compared to the number of dropped packets during ECT-2.

Resource Utilization

- UserStations and Sybase Server exceeded 50% utilization requirements during periods of telemetry receipt
- Poor quality of data resulted in numerous limit violation error messages, making the User Stations unusable until they subsided.

Performance Results Response Times

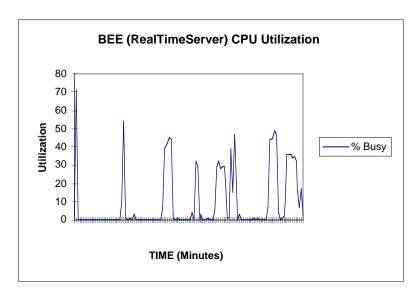


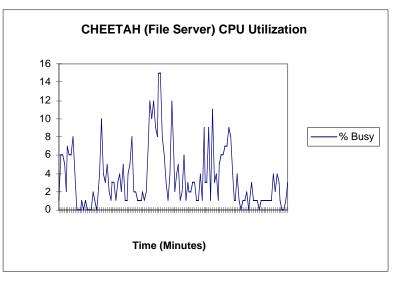
Startup Scripts	Completion Time
Data Server	3:01
Real Time Server	3:02
	2:25
	2:42
User Station - PAS	3:00
	3:15
	3:32
(telemetry online)	3:45
	6:24
User Station - No PAS	1:31
	1:31
	1:35
	2:07

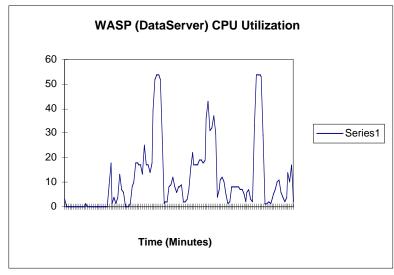
User Activities	Completion Time
Connect to String	2:21
	2:22
	2:33
	2:21
	1:28
Bring up Command Control Window	:32
	:31
Bring up Display Page (no telemetry online)	1:04
	1:09
Bring up Display page (telemetry online)	Did Not Appear
	Did Not Appear
Initialize RTS Load Builder	:27
Initialize Table Load Builder	:07
Initialize Binary Load Builder	:02
Initialize Procedure Builder	:25

Performance Results CPU Utilization (1 of 3)



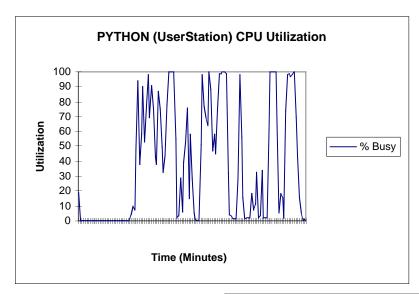


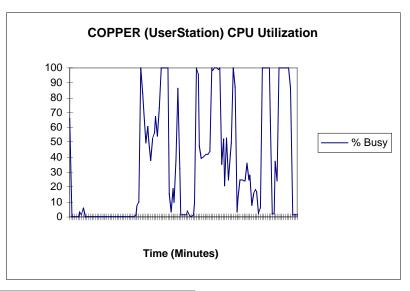


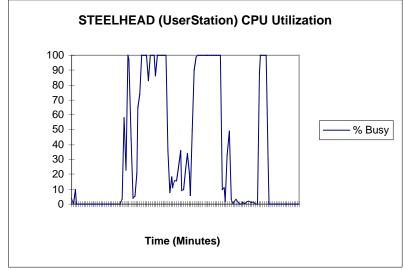


Performance Results CPU Utilization (2 of 3)

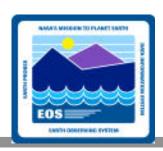


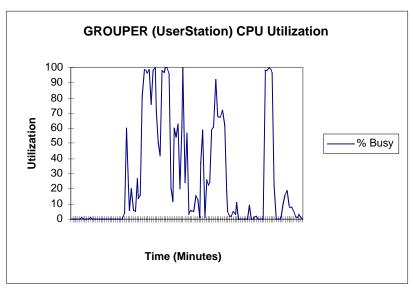


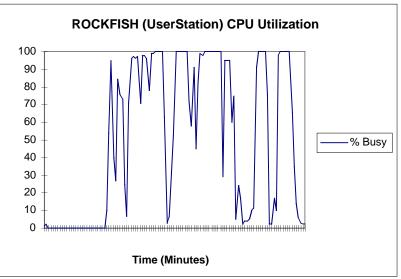


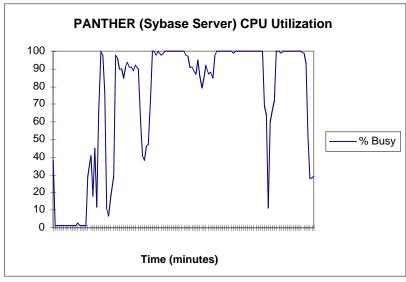


Performance Results CPU Utilization (3 of 3)





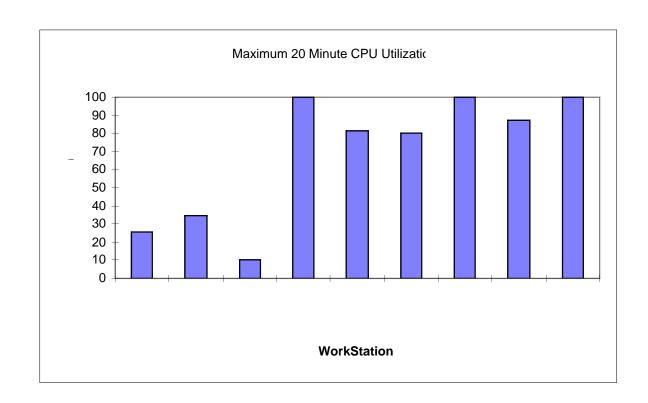




Performance Results Maximum CPU Utilization



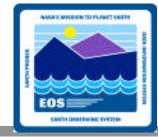
WorkStation Type	Maximum 20 Minute CPU Utilization
RealTime Server	25.9
Data Server	34.5
File Server	10.2
Sybase Server	100
User Station	81.1
User Station	80.2
User Station	100
User Station	87
User Station	99.7





Release B NCR Summary

	Sev1	Sev2	Sev3	Total
Open	51	339	344	734
Fixed	6	24	19	49
Pending Verif	32	123	59	214
Closed/ Verif	54	219	188	461
Total	143	705	610	1,458



Liens (1 of 18)

Database Backup and Restore (DBS-2010B)

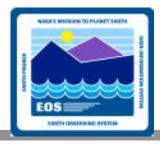
- Description
 - Backup and restore Sybase tables through Netscape browser
- Impact
 - Task would have to be performed manually by DBA
- Analysis
 - Backup has been verified
 - Need to verify restore works correctly



Liens (2 of 18)

SSR Monitoring (CONT-2030B)

- Description
 - Monitor status of SSR playbacks during S/C contact session using telemetry, UPD, and CODA data
 - Update models and provide feedback to FOT
- Impact
 - FOT would have to perform manual monitoring and evaluation of SSR playbacks
- Analysis
 - Update the rules within the RTWorks Inference Engine for proper processing of Telemetry, UPD, and CODA data
 - Resolve interfacing issues with RTWorks and C++ processes



Liens (3 of 18)

User Algorithms (ANA-2040B)

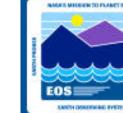
- Description
 - Analyze archived data using user supplied algorithms conforming to published API
 - Analyze archived data using IMSL routines for curve fitting, data smoothing, FFTs, and root mean squares
- Impact
 - FOT would not have access to these advanced analysis capabilities
- Analysis
 - S/W process for reading data from internal datasets and applying algorithms requires modifications



Liens (4 of 18)

Derived Parameters (TLM-2060B)

- Description
 - Processing of database-defined derived parameters during real-time
- Impact
 - Derived parameter data values not available to FOT
- Analysis
 - Database ODF generation processing required modifications to correctly generate ODFs for tlm processing of derived parameters

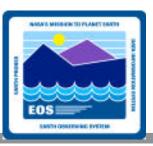


Liens (5 of 18)

IST Pool Management (IST-2000B)

- Description
 - Manage the number of ISTs permitted to connect to the EOC concurrently and by site
- Impact
 - Unlimited access to EOC by IST users
- Analysis
 - Increment/decrement function within the IST pool management software needs to be corrected

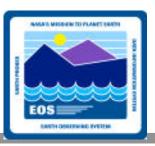




Standing Order Manager (ANA-2010B)

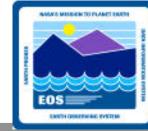
- Description
 - Submit analysis requests to be processed at user defined times and intervals
- Impact
 - FOT would be required to submit each analysis request every time they wanted it processed
- Analysis
 - Requests are being queued and forwarded at the appropriate time
 - Request Manager S/W requires modifications to support receipt of multiple standing orders

Liens (7 of 18)



Analysis Request Manager (ANA-2120B)

- Description
 - Monitor the status of analysis requests in the queue
 - "Farm" requests to participating UserStations
- Impact
 - Cannot view the status of analysis requests or modify the priority
 - Requests can only be processed on UserStation initiating the request
- Analysis
 - JAVA application for monitoring/updating the queue needs to be accessible from FUI Tools menu
 - Farming S/W requires modifications to detect and utilize available UserStations for processing



Liens (8 of 18)

Clock Correlation - RDD (ANA-2020B)

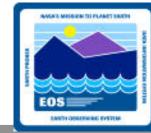
- Description
 - Perform S/C clock correlation using the Return Data Delay method (S/C time, ground receipt time, equipment delays, and ranging data)
- Impact
 - S/C clock cannot currently be correlated to UTC correctly
- Analysis
 - S/W requires modifications to perform calculation at longer intervals, currently calculating every second



Liens (9 of 18)

Clock Correlation - USCCS (ANA-2030B)

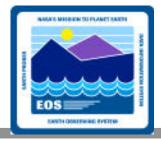
- Description
 - Correlate S/C clock with UTC by use of the USCCS method (TDRSS PN ranging epochs)
- Impact
 - S/C clock drift cannot be corrected to UTC
- Analysis
 - Test tools and data not available to perform testing



Liens (10 of 18)

SCS Summary Report (EDOS-2010B)

- Description
 - Generate TDRSS session summary report following spacecraft contact session automatically
- Impact
 - TDRSS session summary data not available to FOT following the contact session
- Analysis
 - File Watcher process needs to be updated to correctly initiate processing of the summary data into the report



Liens (11 of 18)

Ground Telemetry Replay (NCC-2040B)

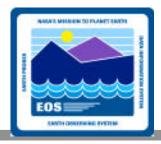
- Description
 - Replay CODA and UPD data from the archive
- Impact
 - CODA and UPD data not available to the FOT for analysis from the archive
- Analysis
 - Data Retriever process dropping connection with analysis software



Liens (12 of 18)

Custom Report (ANA-2060B)

- Description
 - User-defined Custom Reports option via the User Interface
- Impact
 - FOT unable to define Custom Report templates and apply templates to archived data
- Analysis
 - S/W not mature; requires additional development and testing



Liens (13 of 18)

System Statistics (ANA-2100B)

- Description
 - Automatic generation of orbital, daily, and monthly statistics when rate-buffered data arrives in the EOC
- Impact
 - FOT not able to access pre-processed statistical data for S/C telemetry data
- Analysis
 - Propagation of orbital to daily to monthly statistics requires modifications



Liens (14 of 18)

Parameter Out of Limits Report (ANA-2070B)

- Description
 - Generate reports indicating limit violation information for S/C telemetry data (number, times, durations)
- Impact
 - Cumulative limit violation data not available to the FOT upon demand
- Analysis
 - Requires System Stats to be correctly generated to determine limit data



Liens (15 of 18)

Ground Telemetry Analysis (EDOS-2001B)

- Description
 - Analyze UPD and CODA data contained within the archive
- Impact
 - Archived data not available to the FOT for analysis
- Analysis
 - Data Retriever process dropping connection with analysis software



Liens (16 of 18)

Info Window (TLM-2020B)

- Description
 - Obtain information on telemetry data defined in the PDB (limit settings, descriptions, calibration info, etc)
- Impact
 - Informational data not available on-line to FOT
- Analysis
 - S/W not in mature state; requires additional development and testing



Liens (17 of 18)

Context Dependent Tlm (TLM-2020B)

- Description
 - Decommutation of context dependent parameters
- Impact
 - Context dependent parameters not available for monitoring and analysis
- Analysis
 - Updates to Sybase tables and telemetry ODFs required



Liens (18 of 18)

CMD Echo (EDOS-2001B)

- Description
 - Test the status of the comm link between the EOC and EDOS through a test message
- Impact
 - Status of comm link unknown when traffic idle
- Analysis
 - Test driver for emulating EDOS requires modifications to recognize test message

Functional Criticality Assessment (from CSR-2)



HIGH

<u>Analysis</u>

RDD Clock Correlation USCCS Clock Correlation

Telemetry

User Adjustment of EU Conv-Context Dependent Decom

Contact

SSR Monitoring

End-to-End

Concurrent Ops/Performance

FDF

FDF Interface

<u>IST</u>

IST Functionality

MEDIUM

Analysis

Parameter Out Of Limits
System Stats
Analysis Request Manager
Special Processing Algorithms

EDOS

Ground Telemetry ReplaySCS Summary Report **Ground Telemetry Analysis**

IST

IST Pool Management

Data Base

DB Backup and Restore

LOW

FOS User Interface

Room Builder

Telemetry

Info Window

Analysis

Standing Order Manager Custom Reports

EDOS/NCC

Test CMD/CMD Echo